



## Economic Issues Associated with 3000-4000MW of Wind in Illinois

### New York

On March 4, 2005, GE Energy Consulting provided the New York State Energy Research and Development Authority (NYSERDA) with the final draft of our analysis of technical and economic issues associated with large-scale wind power in New York State. Key findings of the report, "The Effects of Integrating Wind Power on Transmission System Planning, Reliability, and Operations," include:

- The New York State Bulk Power System (NYSBPS) can reliably accommodate at least 10% penetration, 3300 MW, defined by installed rated wind generation MW compared to peak statewide load in 2008. The study did not identify any significant integration costs or reliability impacts at this level of penetration.
- We expect a slight increase in variability for each time frame of operation related to scheduling, load following and regulation. No increase in regulation is necessary to meet minimum NERC requirements.
- The transient stability behavior of wind generation is significantly different from that of conventional synchronous generation. Simulation results demonstrate that overall stability performance of the bulk power system is better with 3,300 MW of state-of-the-art wind generation than it is without wind generation.

### Illinois

Observations and conclusions presented in the NYSERDA report are based on a comprehensive 18 month analysis costing approximately \$500k. Although Illinois does not yet benefit from a state specific study, some inferences may be drawn from the New York report.

- Topologically, Illinois has many similarities to New York – both states have a substantial EHV transmission network, substantial ties to neighboring states and a systems mix of high density urban load centers and less dense suburban and rural system.
- The RPS initiative will spur development of generation that displaces energy from less-efficient coal, oil and gas in both IL and neighboring states.
- We would expect that a level of roughly 3000-4000 MW of wind, serving 5-10% of retail energy needs of the state, could be reliably integrated into the Illinois system without significant reliability impacts. Given sufficient geographic diversity, costs of integration, due to the differences in generation mix, are expected to be minimally higher than New York. Other system studies in the US have identified ancillary services costs on the order of \$1-\$5/MWh for wind integration<sup>1</sup> and we speculate that the costs for Illinois would be at the low end of this range.
- The New York study found that the aggregate value of displaced fuel and variable O&M costs is approximately \$430 million (equivalent to approximately \$50/MWh of wind production). Recognizing that Illinois has more coal generation than New York, we would expect slightly less but still highly significant savings in production costs.

We expect that the NYSERDA final report will be posted onto the DPS website (<http://www.dps.state.ny.us/03e0188.htm#related>) shortly.

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<sup>1</sup> *Wind Integration Study – Final Report*. Xcel Energy and the Minnesota Department of Commerce, September 28, 2004.